Comment Summary Response & Concise Statement – WQ075
Amendments to the Water Quality Regulations
Dissolved Oxygen Criteria for Barataria and Terrebonne Basins
LAC 33:IX.1105, 1113, and 1123

Concise Statement arguments:

FOR: [The reason supporting WHY the suggestion in the comment should be adopted by DEQ. Usually this is the commenter's perspective.]

AGAINST: [The reason WHY the department feels the suggestion should NOT be adopted.]

Use these standardized statements where you feel they may be appropriate:

FOR/AGAINST -- No arguments necessary; comment does not suggest amendment or change.

FOR/AGAINST -- The department agrees with the comment; no arguments are necessary.

FOR/AGAINST -- No arguments necessary since the provision in question is not part of this rulemaking.

RESPONSE -- The department appreciates the support.

COMMENT 1: — The EPA commends the department on their proposed ecoregion-based approach to developing dissolved oxygen (DO) criteria. The approach provides a sound, scientific framework for this and future ecoregion-based efforts.

FOR/AGAINST -- No arguments necessary; comment does not suggest amendment or change.

RESPONSE 1: — The department appreciates the support.

COMMENT 2: — The EPA commends the department on the integration of data collected through outside programs and projects, and through other state agencies. The information obtained by compiling these diverse datasets provides a comprehensive view of the conditions within the ecoregion.

FOR/AGAINST -- No arguments necessary; comment does not suggest amendment or change.

RESPONSE 2: — The department appreciates the support.

COMMENT 3: — The EPA commends the department on its coordination with the EPA during the parallel studies of the Terrebonne watershed

conducted by the EPA and the department in 2005.

FOR/AGAINST -- No arguments necessary; comment does not suggest amendment or change.

RESPONSE 3: — The department appreciates the support.

COMMENT 4: — The EPA agrees with the incorporation of water-body-specific information into the Water Quality Management Plan, which provides a framework for transparency in this and in future ecoregion-based revisions to the water quality regulations.

FOR/AGAINST -- No arguments necessary; comment does not suggest amendment or change.

RESPONSE 4: — The department appreciates the support.

COMMENT 5: — LMOGA supports the proposed amendments to the DO criteria for the listed stream segments in the two basins and commends the department's efforts to recognize the uniqueness of many Louisiana water bodies with the development of DO criteria specific to Louisiana.

FOR/AGAINST -- No arguments necessary; comment does not suggest amendment or change.

RESPONSE 5: — The department appreciates the support.

COMMENT 6: — The department's ecoregional approach to lower DO criteria conflicts with state law. The LAC provides that the department may make its water quality criteria less stringent by taking into account site-specific, local conditions, and may only make changes for the sites that were sampled. The LAC does not provide for such modifications of water quality criteria on an ecoregional basis. The department also proposes less-stringent criteria for Outstanding Natural Resource Waters (ONRWs) without a showing that the proposed criteria protect and maintain such waters. This is prohibited by state and federal law.

FOR: LAC 33:IX § 1113.A.3 specifies that criteria may be modified based on site-specific or local conditions.

AGAINST: Modifications to the water quality criteria are in accordance with state and federal regulations. “Site”, as defined in the Water Quality Standards Handbook, may refer to a state, region, watershed, water body, or reach. LAC 33:IX § 1113.A.2 also supports the use of data from similar water bodies for criteria development.

RESPONSE 6: — The Department has developed proposed ecoregional dissolved oxygen criteria for the Barataria and Terrebonne Basins in accordance with state and federal regulations, policies, and guidance. LAC 33:IX § 1113.A.3 states, “General and numerical water quality criteria may be modified to take into account site-specific, local conditions.” In terms of water quality standards and criteria development, the term “site” or “site-specific” is not limited to a specific set of coordinates or a single reach of a water body, and is described the UAA and other supporting scientific studies upon which the standards revision is based. Chapter 2, Section 2.9 of EPA’s 1994 *Water Quality Standards Handbook* (the *Handbook*) states, “States may also conduct generic use attainability analyses for groups of water body segments provided that the circumstances relating to the segments in question are sufficiently similar to make the results of the generic analyses reasonably applicable to each segment.” Furthermore, Chapter 3, section 7.3 of the *Handbook* states “In the general context of site-specific criteria, a “site” may be a state, region, watershed, water-body, or segment of a waterbody.” In the case of proposed rule WQ075 and the supporting documentation, “site-specific” refers to subsegments within two ecoregions.

States and authorized tribes have several options when adopting water quality criteria for which the U.S. EPA has published nationally recommended criteria pursuant to Section 304(a) of the CWA, which includes criteria for dissolved oxygen. States may: (1) adopt nationally recommended criteria; (2) adopt nationally recommended criteria modified to reflect site-specific conditions; (3) adopt criteria derived using other scientifically defensible methods; or (4) establish narrative criteria where numeric criteria cannot be determined (40 CFR 131.11).

The ecoregional approach is an EPA-accepted method of criteria development which has been the basis for water quality standards revisions in other states; and these revisions have been supported by EPA. The ecoregional approach involves identifying reference conditions in an area of similar geography, hydrology, and other ecologically relevant variables. Application of regionally specific data is also supported by state regulations, specifically LAC 33:IX § 1113.A.2 states that, “Criteria in these cases are established on the basis of the best information available from water bodies which are similar in hydrology, water quality, and physical configuration.” LAC 33:IX§

1113.A.3 further states, “General and numerical water quality criteria may be modified to take into account site-specific, local conditions. Whenever data acquired from the sources named in LAC 33:IX.1113.A.2 or other sources indicate that criteria should be modified, the department will develop and recommend revised site-specific criteria. The revised criteria will be submitted to the EPA for approval and promulgated in accordance with established procedures including, but not limited to, those in the Louisiana Administrative Procedure Act, R.S. 49:950 et seq.” Therefore, the regional approach which considers local conditions, such as the geography, soils, vegetation, and hydrology, is supported by state law, and is not prohibited by the water quality regulations.

Outstanding Natural Resource Waters (ONRWs) are waters that are designated “for preservation, protection, reclamation, or enhancement of wilderness, aesthetic qualities, and ecological regimes” and may include characteristics such as unique riparian habitat, high species diversity, or unique species. However, these waters also exhibit the same natural features characterized by other waters within the Coastal Deltaic Plain (CDP) and Lower Mississippi River Alluvial Plain (LMRAP) Ecoregions: low flow, low gradient, and a high level of natural organic input, resulting in naturally and seasonally low dissolved oxygen levels. However, waters that were designated as ONRW were evaluated separately from other waters in these two ecoregions. Ecoregional-based criteria are not being proposed if the existing water quality (DO level) was determined to be better (higher) than the proposed ecoregional criteria or if no data were available to make a determination.

COMMENT 7: — The department’s ecoregional approach to modifying DO criteria fails to meet the federal and state requirements to protect water bodies where the DO levels are higher than the current or proposed minimum.

FOR: In cases where the 10^{th} percentile of the reference site(s) data exceeded the national benchmark, LDEQ will not propose to modify the DO criteria.

AGAINST: State and federal regulations already exist to protect waters where the quality is better than necessary to support fish and wildlife propagation and recreation.

RESPONSE 7: — State and federal regulations specify requirements to provide protection for fish and wildlife propagation and recreational uses in the nation’s waters. Specifically, 40 CFR § 131 provides states and EPA the statutory basis for assigning designated uses and adopting criteria

to protect such uses. However, 40 CFR § 131.2 (Antidegradation Policy) also states, "Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully..."

The water quality standards regulations in support of this federal requirement are found in the state's Antidegradation Policy (LAC 33:IX.1109.A) and Implementation Plan for Antidegradation Policy (LAC 33:IX.1119). LAC 33:IX.1109.A.1 provides, "…The state may choose to allow lower water quality in waters that exceed the standard to accommodate justifiable economic and/or social development in the areas in which the waters are located but not to the extent of violating the established water quality standards. Appropriate use attainability analyses will be required before any lowering of water quality will be allowed. No such changes, however, will be allowed if they interfere with or become injurious to the existing water uses." This provision, which is required by the federal regulations (40 CFR 131.12(a)(2)) is typically referred to as "Antidegradation Protection of Tier 2 Waters" or simply "Tier 2", which requires states to justify any activity where there may be a potential lowering of water quality in 'higher quality waters'. The Implementation Plan for Antidegradation Policy (LAC 33:IX.1119) is implemented by "…ensuring that for all activities which may impact water quality and are permitted by the state, or for which there must be a permit on which the state comments, consideration is given to requirements of the policy…" Examples of these activities are named in LAC 33:IX.1109.A.2 and include water discharge permits, and certification of activities for federal permits.

Water quality standards are applicable to all waters; however, implementation of those standards may not be possible in all circumstances, including those due to natural conditions (i.e., LAC 33:IX.1109.B.3), and the UAA process may be employed (LAC 1119.C.1). With respect to Antidegradation, as stated above, that means existing uses must be protected (as in accordance with 40 CFR 131.12(a) (1)). LDEQ used the EPA-supported ecoregion approach to determine existing aquatic life uses and establish appropriate dissolved oxygen criteria for water body types in the Barataria and Terrebonne Basins UAA study. The results of the UAA did not demonstrate that a 'higher' or better fish and wildlife propagation use

was indicated for waters in which the levels for dissolved oxygen may be higher overall than the national benchmark currently in the water quality standards.

Additionally, LDEQ is in the process of developing more detailed Tier 2 implementation procedures, which support provisions for Antidegradation in programs that are already in place and that define and provide protection for waters of 'higher' quality, and for ONRWs.

COMMENT 8: — The department fails to present any analysis that could permit it to allow degradation of high quality waters. State and federal regulations allow such degradation if the state finds that it is necessary to accommodate important economic or social development in the area in which the waters are located. The department has presented no such analysis.

FOR: The proposed revisions do not include a process to allow degradation in high quality waters.

AGAINST: Criteria recommendations are based on data compiled from reference streams and represent the best attainable dissolved oxygen criteria for these water bodies. No activities allowing degradation are being proposed by these revisions.

RESPONSE 8: See the response to Comment 7.

COMMENT 9: — The department's proposed criteria are unlawful because the department fails to consider the impact of its proposed criteria on designated uses other than fish and wildlife propagation, in particular on oyster propagation. The department's use attainability analysis (UAA) states that some sub-segments of the affected water bodies have oyster propagation as a designated use, but that evaluation of this use is beyond the scope of the UAA. The UAA also does not provide any analysis that considers the effects of the less-stringent DO standard on water bodies with an ONRW designated use.

FOR: Federal regulations (40 CFR 131.11(a)(1)) require states to adopt criteria to protect the most sensitive use.

AGAINST: The dissolved oxygen criteria are indicators of support for the Fish and Wildlife Propagation Use, which is considered the most sensitive use. A UAA for other uses and criteria that are considered attainable and

existing would not be appropriate.

RESPONSE 9: —LDEQ considers the fish and wildlife propagation use to be the most sensitive use in these waters; and the use which requires the most stringent protection in terms of criteria (numerical and narrative). LAC 33: IX § 1111 defines fish and wildlife propagation as "the use of water for aquatic habitat, food, resting, reproduction, cover, and/or travel corridors for any indigenous wildlife and aquatic life species associated with the aquatic environment." The term "any" with regard to species also includes oysters in areas where the habitat is suitable for oyster growth and propagation. However, scientific literature indicates that oysters are one of the more tolerant aquatic species to low dissolved oxygen conditions and also tolerate a wide range of other environmental conditions (Eastern Oyster Biological Review Team 2007; Stickle et al. 1989), thus making oysters an unsuitable "sensitive" species to determine the overall support of the fish and wildlife propagation use.

Section 1111 also defines "Oyster Propagation" as "the use of water to maintain biological systems that support economically important species…so that their productivity is preserved and the health of the human consumers of these species are protected." The indicator or criterion that supports oyster propagation use in the water quality standards is fecal coliform, which protects the human health component of the designated use (consumption of oysters). At this time, the department is not proposing to change the fecal coliform criterion. Furthermore, the oyster propagation use is considered the designated and existing use unless the Louisiana Department of Health and Hospitals (LDHH) determine the use is not attainable. The Louisiana Molluscan Shellfish Program administered by LDHH classifies shellfish growing areas in Louisiana four times per year, and these areas are conditionally managed on the stage of the Calcasieu River. LDEQ works with LDHH to update the water quality standards regarding areas designated for oyster propagation on an "as needed" basis.

The department separately evaluated each subsegment in Barataria and Terrebonne basins designated as an ONRW, Please also see the response to Comment 6.

COMMENT 10: — The department's proposed criteria unlawfully circumvent state and federal laws prohibiting removal of designated uses that are also existing uses. By state and federal law, the department may not remove an existing use. Instead of formally removing any designated

use, the department has modified its criteria to be less protective than the national criteria without changing those existing designated uses.

FOR: Federal law prohibits the removal of any use that is an existing use.

AGAINST: The department is not proposing to remove any existing use.

RESPONSE 10: —State and federal regulations include provisions to modify uses and/or criteria to take into account region-specific conditions and to recommend criteria revisions (LAC 33:IX § 1113); please see the response to Comment 6. However, in this case, no uses were removed as a result of the proposed dissolved oxygen criteria changes.

COMMENT 11: — The department's proposed criteria are unlawful because the department has not based those criteria on sound scientific rationale. The information provided by the department is not a structured scientific assessment of the level of protection necessary to support the full fish and aquatic life uses assigned to the affected waters. The department's data does not specifically support the adoption of the proposed criteria.

FOR: State and federal regulations prohibit the removal of an existing use.

AGAINST: The criteria developed in the UAA support the designated and existing uses.

RESPONSE 11: — The state may not remove a designated use that is an existing use, as defined in 40 CFR 131.3 of the CWA, and LAC 33:IX.1105. However, a designated use that is not an existing use may be removed through a UAA if the water body meets any of the criteria set forth in LAC 33:IX.1109.B.3. Data support the designated and existing use as fish and wildlife propagation in certain water bodies; therefore, ecoregional dissolved oxygen criteria have been developed to support the use in these water bodies.

The water quality standards regulations contain policy statements on several processes, including designating water uses (LAC 33:IX.1109.B). According to state and federal regulations, standards (which include designated uses) are not fixed for all time, but are subject to revision (40 CFR 131.20; LAC 33:IX.1109.H). Among the nature of future revisions are changes in technology or natural conditions, or the availability of new data which may require a revision of the water quality standards. Such revisions are allowable only after considering designated uses and must be consistent with state and federal regulations (LAC 33:IX.1109.H.1.c).

The department's proposed criteria, developed using an ecoregional approach, are based on sound, scientific rationale. The ecoregional approach, developed by and promoted by the US EPA, provides a regional framework for management of water resources and is supported by over twenty-five years of comprehensive peer-reviewed literature, EPA guidance, and documentation produced by state and federal agencies. The UAA study was conducted using 296 sampling events at 26 sites, over several seasons representing 2 years or more of data on reference sites. This approach is consistent with EPA's guidance which allows for the use of UAAs or other appropriate scientific studies for entire classes or types of water bodies based on the demonstrations in 40 CFR 131.10(g)(2) factors (WQS Handbook, Appendix D, Chapter 3). Furthermore, LDEQ will evaluate these water bodies when considering a wastewater discharge on a case-by-case basis as the individual permit decisions arise to ensure that designated uses are being protected, and also reflect existing uses.

COMMENT 12: — The department fails to meet its constitutional duties as public trustee and steward of the environment because it has not shown that it is (1) protecting designated uses, (2) protecting existing uses, (3) protecting high quality or impaired waters, (4) basing its proposed criteria on sound scientific rationale, and (5) minimizing or avoiding adverse environmental impacts. Since it is the department's constitutional duty to ensure that the waters of the state are protected, the department must revise its analysis and proposed criteria to fulfill this obligation.

FOR: The department must meet all state and federal requirements regarding the development and refinement of criteria to protect existing and designated uses.

AGAINST: The department has met all state and federal requirements with regard to the development of appropriate dissolved oxygen criteria in the Barataria and Terrebonne basins.

RESPONSE 12:—The water quality standards regulations (LAC 33:IX, Chapter 11) contain policy statements on several processes, including designating water uses (LAC 33:IX.1109.B). As stated previously (see response to Comment 11), a designated use that is not an existing use may be removed or revised through a UAA if the water body meets any of the criteria set forth in LAC 33:IX.1109.B.3. According to state and federal regulations, standards (which include designated uses) are not fixed for all time, but are subject to revision (40 CFR 131.20; LAC

33:IX.1109.H). Among the nature of future revisions are changes in technology or natural conditions, or the availability of new data which may require a revision of the numerical criteria at any time. However, such revisions are allowable only after considering designated uses and must be consistent with state and federal regulations (LAC 33:IX.1109.H.1.c).

The Louisiana legislature has provided that the Secretary of the Louisiana Department of Environmental Quality shall act as the primary public trustee of the environment, and shall consider and follow the will and intent of the Constitution of Louisiana and Louisiana statutory law in making any determination **relative to the granting or denying of permits, licenses, registrations, variances, or compliance schedules** authorized by this Subtitle. [Environmental Quality Act] (Emphasis added) La. R.S. 30:2014.A.(4).

Further, the legislature requires the submission of an environmental assessment statement by permit applicants to the LDEQ for consideration when making decisions regarding certain permits. The environmental assessment statement is required to be used to satisfy the public trustee requirements of Article IX, Section 1 of the Constitution and must address what is commonly referred to as the "IT" questions. See. La. R.S. 30:2018.B. Rulemaking activities are specifically excluded from these statutory requirements. Therefore, based on the statutory omission of rulemaking from the public trustee requirements, the LDEQ is not required to perform an "IT" analysis in the development of a rule. However, notwithstanding this conclusion, the LDEQ carefully considered potential adverse environmental impacts, economic and environmental benefits, and scientific information gathered during the UAA studies by LDEQ and EPA, in the development of this rule.

COMMENT 13: — The department fails to follow the procedures outlined in its Memorandum of Agreement with the EPA. The department did not present an analysis of whether stream size was a significant predictor of DO dynamics and did not follow agreed-upon procedures to determine that reference sites are representative of the water bodies they reference.

FOR: The *Development of Dissolved Oxygen (DO) Criteria to Support Fish and Wildlife Propagation in Louisiana Waters Based on Ecological Regions ("Ecoregions") and Water Body Types* discusses size classifications and slope as factors that may be considered when developing appropriate criteria.

AGAINST: Size classifications and slope considerations are a data-driven process and should be considered only as significant differences among reference sites are found.

RESPONSE 13: — The department considers drainage areas (i.e. watershed size) and/or stream order in ecoregion criteria development as appropriate when data are collected that may indicate watershed size is a predictor of dissolved oxygen dynamics. In the case of the Barataria and Terrebonne Basins, the hydrological features are a complex system of inter-connecting bayous, lakes, and bays that are tidally influenced and connected by many short, man-made canals and canal interconnections (i.e. guts". Most of the area of the two basins is just at or slightly below sea level. Due to the lack of slope and the tidal influences, typical north to south flow of water does not always occur. These combining factors confound drainage area calculations. The unique features of the Barataria and Terrebonne basins are some of the factors that led the department to analyze these two basins separately from the rest of the basins in the CDP and LMRAP Ecoregions. The reference sites (by water body type) were selected by LDEQ using appropriate methods as described in the UAA, and represent the best attainable conditions that can be achieved in these two basins.

COMMENT 14: — The department fails to show whether the water quality of the reference sites has been affected by human activities, despite studies by the EPA that suggest the sites have been so affected, and despite data gathered by the department that also suggests the sites have been so affected. This undermines the validity of the department's analysis.

FOR: Human activities, such as point and nonpoint sources of pollution, hydromodification should be considered in the selection of reference site criteria.

AGAINST: LDEQ followed the reference site selection criteria described in the protocol document.

RESPONSE 14: —

Human activities, including point and nonpoint sources were considered in the selection of reference sites using 1) the desktop tools listed in the protocol document and 2) on-the-ground site reconnaissance (site visits). Although desktop screening tools are extremely useful and resource-conservative when evaluating <u>potential</u>

reference sites, on-the-ground reconnaissance provides the most accurate assessment of a water body's condition. Specifically, many point sources identified using the desktop tools were found to have virtually no impact on the reference water bodies (i.e. wells that have long since been capped, permitted dischargers that were not actually operating). Lists of permitted dischargers and any potential impacts from nonpoint sources were described in the final UAA report.

As described in the final UAA report, the reference sites selected are considered least-impacted, not pristine sites; recognizing that some level of human-induced and/or non-controllable disturbance may be present, but that reference sites represent the best attainable conditions within a region. The Barataria and Terrebonne basins are heavily developed and impacted in most areas by anthropogenic sources. The reference sites selected were, comparably, the least-impacted by point and nonpoint sources and the most representative of the two basins and the two ecoregions in which they lie. Some of the reference sites are impacted by natural pollution. For example, these areas are surrounded by wetlands. During high rain events, sediment and black, swampy water from the wetlands are often washed into the adjacent stream or lake. Natural nonpoint sources were identified in Terrebonne Basin TMDL reports as a contributor to oxygen demand (Tetra Tech 2008; LDEQ 2008).

The two basins are also heavily hydrologically-modified. Although the protocol specifies that reference sites should preferably not be hydromodified, a few least-impacted canals were selected as reference sites because 1) these types of water bodies are common in southeastern Louisiana and considered representative of the two basins, and 2) appropriate criteria for canals needed to be developed in order to protect the existing fish and wildlife population.

COMMENT 15: — The department does not base its proposed criteria on sound scientific rationale because it relies upon nonrepresentative information, including reference sites that have DO profiles that are much higher or lower than the normal range of DO data and reference sites with abnormal biological findings. The department should revise its analysis to exclude nonrepresentative information.

FOR: Abnormal or unrepresentative data should not be used for criteria development.

AGAINST: The department evaluated all data used in the criteria development process and excluded abnormal data from the analysis.

RESPONSE 15: — The department developed a rigorous procedure to evaluate and qualify continuous monitoring data collected as part of the Barataria and Terrebonne UAA. Data collected by EPA were also subject to this procedure. Any data that were considered nonrepresentative were excluded from data analysis. The procedure and the data that were excluded from analysis were described in Appendix B of the final UAA report. As biological data was not used to develop any index or criteria, all biological data collected by LDEQ was reported and gear biases were identified. Specifically, some locations could not be sampled via electroshocking due to high specific conductance, which interferes with the sampling equipment and the only data available was via hoop nets or traps. Biological data collected by the Louisiana Department of Wildlife and Fisheries (LDWF) was culled to include only those programs that focused on collection of the entire fish community, rather than species-targeted programs.

The goal of the project was to characterize the best attainable conditions of representative water bodies within the two basins, not make a determination of what is “good” or what is “bad”. The criteria and selection process for identifying reference sites ensures that the reference sites are least-impacted, accessible sites and representative of the basin and ecoregion. Dissolved oxygen is one of the most variable water quality parameters and it is expected that diurnal dissolved oxygen profiles will vary by water body type and hydrology. Other factors affecting the dissolved oxygen level and the daily ranges are temperature, flow, slope, percent canopy cover, and wind action. All of these variations are considered part of the normal regime of conditions which occur in the study areas.

COMMENT 16: — The department fails to adequately describe the fish communities within each water body and ecoregion and provides no information on macroinvertebrate communities in the ecoregions for which it proposes to change the DO criteria.

FOR: As defined in LAC 33:IX.1105, a biological component is required in a use attainability analysis.

AGAINST: Fish are appropriate indicators of the biological community for the UAA study. If fish are protected, the macroinvertebrate community is also protected.

RESPONSE 16: — During the UAA planning process, fish were selected as the primary aquatic group to characterize the biological community in the selected reference areas. Fish are appropriate indicators of long-term environmental effects and broad habitat conditions as they are

relatively long-lived and mobile (Karr et al 1986). Fish are also directly related to the status of a water body as a fishery resource. LDEQ has considerable expertise with fish collection and identification. Additionally, before and during the LDEQ UAA study, EPA conducted a companion study of 15 reference sites in the Terrebonne Basin entitled, “Derivation of Site-Specific Dissolved Oxygen Criteria for the Terrebonne Basin, Louisiana” to quantify existing conditions protective of the fish and wildlife propagation (aquatic life) use. During the EPA study, data was also provided to LDEQ to incorporate, as appropriate, into the LDEQ UAA study. Results of the EPA study found that biological communities of fish and macroinvertebrates were determined to be compatible with historical fish and macroinvertebrate data for the region. It was also determined that these biological communities followed the same trends with regard to dissolved oxygen. In other words, high quality biological communities (using both macroinvertebrates and fish as indicators) were observed at reference sites which also experienced periods of low dissolved oxygen. EPA’s *Ambient Water Quality Criteria for Dissolved Oxygen Document (EPA 440/5-86-003)* provides that unless data indicates otherwise, a dissolved oxygen criterion protective of fish is adequate to protect aquatic invertebrates.

The UAA study described the fish community at reference sites by utilizing historical data collected by the Louisiana Department of Wildlife and Fisheries, data collected by EPA for a concurrent study in the Terrebonne Basin, and data collected specifically for the UAA project. Species richness (a measure of the number of different species present), species abundance (the total number of individuals of a particular species present), and diversity (which takes into account relative abundance of individuals and species richness) was presented as a description of the fish community observed at reference sites within an ecoregion. Because the existing and designated uses were demonstrated to be consistent in the reference sites, a revision or restructuring of the fish and wildlife propagation designated use which could require more detailed assessment of biological community and structure, was not necessary.

COMMENT 17: — The department fails to test an appropriate number of sites in order to accurately determine the proposed criteria and does not follow the EPA requirement that data taken from multiple sites within one area, or that data taken from one site multiple times, should be considered one test site.

FOR: An adequate number of reference sites are needed to establish meaningful criteria.

AGAINST: The number of reference sites selected within the Barataria and Terrebonne Basins are comparable to other EPA and state studies.

RESPONSE 17: — The number of reference sites the department selected is appropriate given the area represented and the number of water bodies located within the basins. Furthermore, the number of reference sites utilized in this use attainability analysis is comparable to that used by other states in ecoregion studies. Arkansas (*Physical, Chemical, and Biological Characteristics of Least-Disturbed Reference Streams in Arkansas' Ecoregions,* 1987) selected from four to nine reference streams from each of six ecoregions, which encompass the entire state of Arkansas. Similarly, the department included from two to twelve reference sites (depending on water body type) from the Barataria and Terrebonne Basins within the CDP and LMRAP Ecoregions, which encompass a relatively much smaller area than each Arkansas Ecoregion. In addition, the number of reference sites, expressed relatively as a percent, is comparable to that used for ecoregional criteria development in Minnesota (*Minnesota Lake Water Quality Assessment Report: Developing Nutrient Criteria,* 2005). In Minnesota, the number of reference lakes represented on average approximately 2 to 5% of the total lakes assessed (as presented in Figure 1, Minnesota, 2005); by comparison the number of reference sites (by water body type, such as lake, stream, etc.) for the Barataria and Terrebonne Basins represented greater than 9% of the assessed water bodies by type in those basins. Therefore, the number of reference sites selected from the Barataria and Terrebonne Basins are ample given the area represented and the number of actual water bodies by type within the basins. Additionally, there is not an EPA requirement for grouping test sites.

COMMENT 18: — The department's UAA fails to track DO data over a sufficient period of time in order to indicate actual conditions or to provide a sound scientific basis for the proposed criteria. Data from only one year is insufficient to base future criteria on, since water conditions can change from year to year.

FOR: Sufficient data are needed in order to establish seasonal trends and water conditions that can change from year to year.

AGAINST: The department conducted monitoring over a period of 2 years and 10 months in order to obtain an adequate amount of data.

RESPONSE 18: — The department collected DO data beginning in May 2005 through February 2008, covering a period of 2 years and 10 months. For each reference site, DO data was collected at different times of the year and from different years. In particular, the months during and around the critical period, generally mid-spring through late summer, were sufficiently sampled for each reference site. In no instance was DO data only collected from one year for a reference site.

COMMENT 19: — The department fails to show that use of ecoregional criteria for DO is necessary and provides no analysis that shows the DO levels for the two ecoregions are, or should be, different.

FOR: The department did not demonstrate the necessity for refining dissolved oxygen criteria using the ecoregion approach.

AGAINST: The ecoregion approach is an EPA-approved and recommended method of criteria development and refinement and no analysis needed to be conducted to verify the validity of this approach.

RESPONSE 19: — LAC 33: IX §1109.H.c and § 1113.A.2-3 support the revision of criteria, with consideration of designated uses, in accordance with federal regulations. States may use a variety of approaches towards the development of site-specific, regional, or statewide criteria at their discretion, but EPA has oversight of states' water quality standards and must give final approval before revisions can be implemented (40 CFR 131.21). The ecoregional approach to criteria development is well-documented and fully supported by EPA (see response to Comment 11). Each ecoregion represents an area of similar land use, soils, vegetation, and geological features, which has been shown in scientific studies (e.g., Heiskary et al. 1987; Barbour et al. 1996) to account for variability in water quality conditions. Precedents exist for the adoption of dissolved oxygen criteria developed using an ecoregional approach (e.g. states of Arkansas and Tennessee) and no further analysis that examines the validity of this approach is necessary.

COMMENT 20: — The department fails to present scientifically sound criteria because it does not define its water body classifications or explain how such classifications are made.

FOR: Water body type classifications should be defined with respect to criteria development.

AGAINST: Water body type classifications are defined in the appropriate volume of the Water Quality Management Plan, Volume 4: Basin Subsegments and Boundaries.

RESPONSE 20: — Water body type definitions and the source(s) of those definitions are presented in the most recent update of Volume 4 of the Water Quality Management Plan: Basin and Subsegment Boundaries. The most recent update was made available for public review and comment on October 20, 2008 (Potpourri Notice # 0810Pot1).

COMMENT 21: — The department's data fail to support a finding that the proposed DO criteria support the designated use of fish and wildlife propagation by not providing sufficient data about fish or macroinvertebrate species that are or should be in the affected water bodies.

FOR: As defined in LAC 33:IX.1105, a biological component is required in a use attainability analysis.

AGAINST: The department selected fish as the best representation of the biological community. If all life stages of fish are protected, the macroinvertebrate community is also protected.

RESPONSE 21: — Please see the response to Comment 16.

COMMENT 22: — The department's method to determine the new DO criteria relies on non-conservative assumptions that potentially threaten the designated uses. The department uses the 10th percentile of data, instead of the 25th percentile as recommended by the EPA, and only used data collected during the morning hours when DO is typically at the lowest level, instead of using data collected throughout the day.

FOR: Criteria development methods should be based on the most conservative assumptions.

AGAINST: The department's method of criteria development is more conservative than the method recommended by EPA.

RESPONSE 22: — EPA guidance for ambient water quality criteria for dissolved oxygen (EPA 1986) bases DO criteria on a minimum DO (or the 0 percentile). The department also bases its DO criteria on a minimum DO. Data collected during the morning hours is used for criteria development

because it represents the timing of typically low, or minimum DO. While the minimum DO (or 0 percentile) is appropriate for use as the DO criterion as supported by EPA; the department is using the 10^{th} percentile of DO as the criterion rather than the minimum (0 percentile) to allow for a more conservative criterion that should be more protective of the fish and wildlife propagation use. The use of a percentile such as the 25^{th} percentile for criteria development is part of EPA's recommendation for the development of nutrient criteria, and not directly applicable to the development of dissolved oxygen criteria.

COMMENT 23: — The department's methodology fails to ensure that fish and their larvae are protected against the detrimental effects of low DO levels. The proposed criteria provide for different levels of DO during different times of the year, which is not in accordance with EPA guidance that recommends DO criteria should not be lowered based on yearly fluctuations if fish in their early life stages are present in the affected waters.

FOR: All life stages of fish need to be protected by appropriate criteria.

AGAINST: The reference streams selected represent the best attainable conditions in the two basins and attainment of the fish and wildlife use was demonstrated during the critical periods.

RESPONSE 23: — EPA's criteria documents for dissolved oxygen and other guidance and policies (natural background memo) allow for flexibility in development of regional or more 'site-specific' criteria for states to adopt in their water quality standards. In other words, states are allowed the flexibility to adjust the criteria to reflect regional and local environmental conditions (natural). States are not obligated or required to develop DO criteria with means and minimums. In fact, the DO criterion was previously established as a minimum, and approved by EPA.

EPA-6 and LDEQ jointly developed the approach for developing DO criteria – which is documented in the "Memorandum of Agreement: Development of Dissolved Oxygen (DO) Criteria and Assessment Protocols to Support Fish and Wildlife Propagation in Louisiana Waters Based on Ecological Regions (Ecoregions) and Water Body Types". The underlying premise is that reference streams represent the best attainable conditions. Therefore, the fish and wildlife propagation use and corresponding ecological conditions in "least impacted reference waters" are the basis for defining the DO criteria in specifi9ed ecoregions and water body types in Louisiana.

Both the EPA Terrebonne Study and LDEQ UAA concluded that the reference sites and data were indicative of least impaired conditions and are appropriate to characterize as 'natural'. Since the fish and wildlife propagation use was demonstrated during critical periods, the fish and wildlife propagation use is protected, including early life stages.

EPA's *Ambient Water Quality Criteria for Dissolved Oxygen Document (EPA 440/5-86-003)* also recognizes that the centrarchid dominated warm water fisheries of southern waters are adapted to lower DO levels than the salmonids or cold water fishes and that DO protective of fish is protective of aquatic life.

COMMENT 24: — The department fails to meet its own criteria for reference site selection by (1) not creating unique water body exceptions to the proposed criteria, (2) by not considering significant point and nonpoint sources of pollution when choosing its reference sites, and (3) by using reference sites that have been modified or impacted by hydromodification.

FOR: Point and nonpoint sources of pollution, hydromodification, as well as unique water bodies should be considered in the selection of reference site criteria.

AGAINST: LDEQ followed the reference site selection criteria described in the protocol document.

RESPONSE 24: — The department followed the reference site selection process described in *Development of Dissolved Oxygen (DO) Criteria and Assessment Protocols to Support Fish and Wildlife Propagation in Louisiana Waters Based on Ecological Regions (Ecoregions) and Water Body Types* as well as the literature provided by EPA Region 6 concerning reference site selection (Stoddard et al. 2006). Using water body types, including water body types that are man-made or man-altered, as a basis for criteria development reduces the need for creating special exceptions. However, special consideration was given to waters designated as Outstanding Natural Resources (see response to Comment 6). Other water bodies that do not exhibit the natural characteristics of the ecoregions and/or basins in which they reside or have unique characteristics that require special protection will be evaluated on a case-by-case basis. These situations are recognized in the ecoregion protocol, including the possible development of subecoregions or consideration of watersheds that cross ecoregion

boundaries.

Please see response to comment 14 regarding the selection of reference sites and the consideration of human activities in the process.

COMMENT 25: — The department's choice of time and location for its public hearing did not support full public participation. The public hearing was held on November 25, 2008 at 1:30 p.m. at the Galvez Building in Baton Rouge. At least one hearing should have been held within the basins that are affected by this rule.

FOR/AGAINST -- No arguments necessary; comment does not suggest amendment or change.

RESPONSE 25: — LDEQ adheres to all federal and state regulations regarding public participation and rulemaking. LDEQ may solicit input about proposed revisions or other issues as time and a resource allow, and if the Secretary determines that it is necessary to do so beyond the current public participation process. In the case of proposed rule WQ075, the Secretary authorized a public presentation held on August 27, 2008 summarizing the results of the Barataria-Terrebonne Use Attainability Analysis. Interested stakeholders were invited to the presentation. The Notice of Intent for rule number WQ075 was published in the State Register on October 20, 2008 and in nine newspapers across the state, which included areas specified in the revisions.

COMMENT 26: — Despite the fact that the department is attempting to show natural conditions, their data are being used to only lower DO criteria for the affected waters. If the goal is to achieve natural conditions, then the department should propose to raise DO criteria in areas where the data shows DO levels higher than baseline standards.

FOR: Waters where the natural dissolved oxygen level consistently exceeds the national benchmark criterion should be protected.

AGAINST: Federal and state regulations exist to protect waters where the quality is better than necessary to support the designated uses. Additionally, the national benchmark criteria were determined to be fully protective of aquatic life uses in the United States.

RESPONSE 26: —The national benchmark for DO, based on EPA's 304(a)-recommended dissolved oxygen criteria (EPA, 1986, *Water Quality Criteria for Dissolved Oxygen*), were determined by EPA to be protective of the uses in waters of the United States; however, states have the authority to refine DO criteria to reflect local conditions. The department has documented, through site-specific studies, and through water quality simulation modeling, that many Louisiana waters do not meet the present statewide 5 mg/L criterion either on a daily basis and/or on a seasonal basis based on naturally low DO conditions; however, these waters maintain the fish and wildlife propagation use (LAC 33:IX.1111.C). The department is using an ecoregional approach to refine the DO criteria by determining where the current DO criteria are and are not appropriate to support the fish and wildlife propagation use. Thus, the department is proposing ecoregional criteria revisions in areas where DO naturally falls below the national benchmark. In addition, criteria higher than the benchmark have not been determined to be more protective of the fish and wildlife propagation use. In reference areas where DO does not naturally fall below the benchmark, the benchmark remains the criteria and is protective of the fish and wildlife propagation use, as determined by EPA (1986).

Comment Summary Response & Concise Statement Key – WQ075
Amendments to the Water Quality Regulations
Dissolved Oxygen Criteria for Barataria and Terrebonne Basins
LAC 33:IX.1105, 1113, and 1123

COMMENT #	SUGGESTED BY
1 — 4	Jane B. Watson / U.S. EPA
5	Richard T. Metcalf / LMOGA
6 — 25	Galia Aharoni Tulane Environmental Law Clinic
6 — 25	Elizabeth Livingston de Calderón Tulane Environmental Law Clinic
6 — 25	O'Neil Couvillion / Private citizen
6 — 26	Matt Rota / Gulf Restoration Network